

**LITHIUM BROMIDE AIR CONDITIONING PLANT  
STANDARD ENGINEERING DEPARTMENT LOG**  
NAVSEA 9514/1 (Rev. 1-83) S/N 0116-LF-095-1406  
SSBN 616, SSBN 627, and SSBN 640 CL SUBMARINES

**FOR OFFICIAL USE ONLY**

(\*NOTE: Circled figures are critical values requiring shutdown and/or immediate corrective action.)

NAVSEA 9514/1 (Rev. 1-83) S/N 0116-LF-095-1406  
SSBN 616, SSBN 627, and SSBN 640 CL SUBMARINES

(This form replaces all L. B.

Sir Cond. Plant Engr. Dept. Logs)

Special Instructions: See reverse for important notes (1) -(10);										USS										SSBN				Date				Engr. Log No. (File By)									
HOURLY CHECKS	MAX	(Note 1)	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23											
1. Evaporator Absolute Press in Hg	.36	.28(-)	*.20																																		
2. Generator Pump Disch Press PSI	10	4.5(-)	2																																		
3. Absorber Pump Discharge in Hg	5	10	13																																		
4. Refrigerant Pump Discharge	9	4.5	0																																		
5. Strong Solution Temp. °F	*221	204to 220(-)	154																																		
6. Refrigerant Overflow Temp. °F	90	40-50	*35																																		
7. Vapor Condensate	*115	109(-)	95																																		
8. Sea Water in Absorber °F	89	85(±3)	81																																		
9. Sea Water out Absorber °F	99	95(-)	84																																		
10. Sea Water out Condenser °F	106	102(-)	91																																		
11. Chilled Water Inlet Temp. °F	56	53.6(-)	45																																		
12. Chilled Water Outlet Temp. °F	49	45(-)	*38																																		
13. Chilled Water Flow in H2O	150	80	*45																																		
14. Strong Solution out	161	149(-)	119																																		
15. Absorber Sump Level In	6	3-4(+)	*1																																		
16. Air Press PSI (Note4)			3																																		
17. Steam Press PSI	*31	30(-)	4																																		
18. Purge Pump Disch.	61	42-45	39																																		
19. Refrigerant Pump Suct. Temp °F	48	44(-)	*35																																		
20. Seal Water Pump PSI	10	7	4																																		
21. Seal Water Tank Level In	Full	Var.	Empty																																		

1. Weak Solution Specific Gravity (Note 6)	MAX	NORM	MIN	TIME 0000 2300	DAILY CHECKS	MAX	NORM	MIN	TIME	DAILY	MAX	NORM	MIN	TIME 0000 2300	DAILY CHECKS	MAX	NORM	MIN	TIME 0000 2300
2. Weak Solution Sample Temp. °F (Note6)	1.72	1.71(-)	1.60		6. Purge Tank Concentration %	56	52-55	51		11. Equilibrium Diagram Plotted (Note9).	<input type="checkbox"/> Yes <input type="checkbox"/> No				16. Absorber Leak Detection aft PSI/in	10	0	5	
3. Weak Solution % Concentration (Note7)	103	97(-)	86		7. Refrigerant Water Specific Gravity	1.01	1.00	0.99		12. Indicate which set of Pumps Operating	<input type="checkbox"/> Abs/Gen <input type="checkbox"/> Ref				17. Purge Tank Level In	14		8	
4. Purge Tank Specific Gravity (Note 6)	61	53-60	52		8. Generator Pump Suct. Temp. °F (Note 2)	107	101(-)	90		13. Condenser Leak Detection fwd PSI/in Hg	10	0	5		18. Charge Adjustments gal	Initial	Added	rmvd	balance
4. Purge Tank Specific Gravity (Note 6)	1.63	1.56 1.62	1.55		9. Absorber Solution Sat. Temp. °F (Note 7)	47	43(-)	34		14. Absorber Leak Detection fwd PSI/in Hg	10	0	5		18a. Refrigerant (Note 10)				
5. Purge Tank Sample Temp. °F (Note 6)	70	45-69	44		10. Absorber Temp. Spread °F (Note 7)	3	1	0		15. Condenser Leak Detection aft PSI/in Hg	10	0	5		18b. LiBr Solution (Note 10)				

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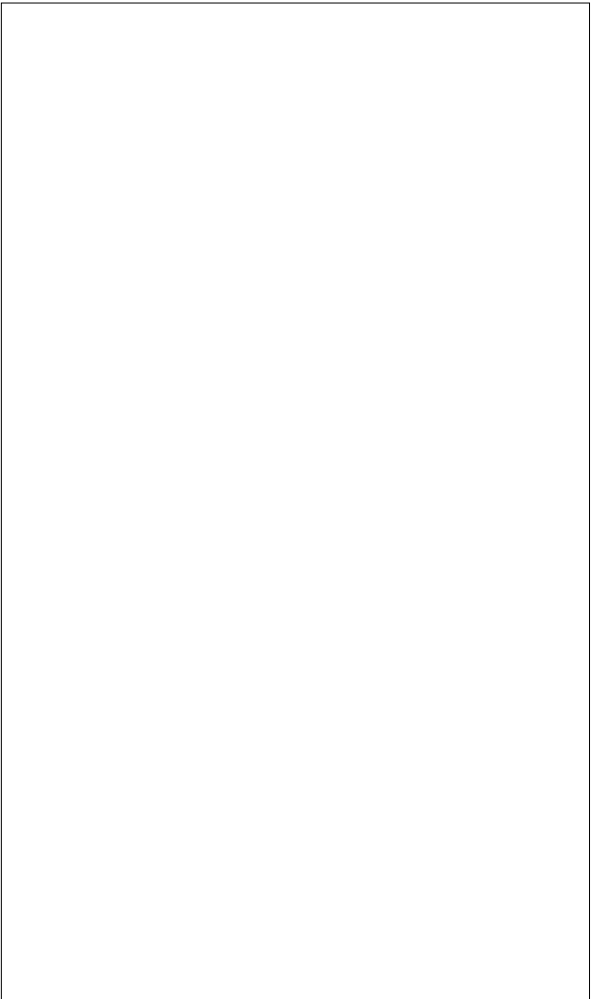
LITHIUM BROMIDE AIR CONDITIONING PLANT  
STANDARD ENGINEERING DEPARTMENT LOG  
NAVSEA 9514/1 (Rev. 1-83) (back)  
ONLY

DATE

NOTES 1 THROUGH 10

NOTE: See Diagram & Notes (1)-(10) below. Continue on 8 1/2" by 14" sheet if additional space is needed.

A. WATCH HOURS 0000 - 0600		B. WATCH HOURS 0600 - 1200	
Watch Stander's Comments and Signature:		Watch Stander's Comments and Signature:	
C. WATCH HOURS 1200 - 1800		D. WATCH HOURS 1800 - 2400	
Watch Stander's Comments and Signature:		Watch Stander's Comments and Signature:	
SIGNATURE - LPO	DATE	SIGNATURE - DIVISION OFFICER	DATE
SIGNATURE - ENGINEER	DATE	SIGNATURE - OTHER (If appl., add title)	DATE



**LITHIUM BROMIDE CONCENTRATION BY WEIGHT**

9. Lithium Bromide Equilibrium Diagram:

- a. Plot "A" represents a typical plant operating at 10% capacity.
- b. Plot "B" similarly represents a plant operating at 100% capacity.
- c. Taller and thinner plots indicate fouled sea water heat exchangers and/or air in plant.
- d. Smaller and wider plots indicate an overconcentrated solution and/or flow obstruction.

1. NORM. Values are design readings at full load conditions. "-" after the value indicates that it decreases at lower air cond. loads. "+" indicates that it increases with decreasing load. The remaining values should remain relatively constant.

2. This temp. may require a temp. dial Thermometer or similar (NSN 6685-00-373-3436).

3. Temperatures lower than normal indicate refrigerant overflow.

4. Ships with 20 PSI air use: NORM 20(-), MAX 21. Ships with 15 PSI air use: NORM 15 (-), MAX 16. Air pressure denotes air signal to steam.

5. Purge pump should not normally operate unless the steam valve air pressure increased to 15 PSI and is still at least 12 PSIG. Pump pressure should then be 45-55 PSIG.

6. Specific gravities and associated temps. are measured using Carrier Test Kit, (NSN 9G-4120-00-797-8648) or similar. All samples are to be recharged into plant.

7. The absorber solution saturation temp. and absorber spread are as follows:

- a. On equilibrium diagram, locate intersection of weak solution specific gravity and sample temperature. Extend a vertical line upward until it intersects with the generator pump suction temperature, then horizontally to the right edge of the diagram. The corresponding value is the absorber solution saturation temperature.
- b. Determine the difference between the solution saturation temperature and refrigerant pump suction temperature. This is the absorber spread. Changes via the running vacuum test may indicate the presence of noncondensable gases providing that the purge system is secured.
- c. The solution concentration is determined by extending the intersection of the generator pump suction temperature and specific gravity vertically, to the bottom edge of the diagram.
- d. Vapor condensate temps. less than 2°F higher than condenser drain lines. Symptoms may be sporadic, include overconcentration
- e. Plot Equilibrium Diagram in accordance with NAVSEA 0959-036-5010, Section 4.2.2 for SSBN 616 and SSBN 627 Classes or NAVSEA 0959-037-0010, Section 3.1.9 for SSBN 640 Class. Note that point 6 of equilibrium diagram cannot be plotted.

10. The proper lithium bromide plant charge is 160 gals. of solution at 53% concentration by weight. The normal refrigerant charge is 78 gals. of water. Abnormal operating parameters are usually the result of blockages, air in-leakage, or poor heat transfer. Do not deviate from the specified amount of lithium bromide solution or refrigerant water unless absolutely necessary. Record all charge adjustments.

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